

EXECUTIVE SECRETARIAT

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Executive Secretary
7/19/83
Date



DEFENSE MAPPING AGENCY
BUILDING 56 U.S. NAVAL OBSERVATORY
WASHINGTON, D.C. 20305

Executive Regist
83-363

15 JUL 1983

SUBJECT: Proposed Implementation of World Geodetic Reference System 1984

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1. In order to satisfy the demands of advanced weapons systems, to support a host of navigational systems and to provide the DoD with a more accurate geodetic model of the earth, the Defense Mapping Agency (DMA) is developing an updated World Geodetic System (WGS). The new system draws on a much expanded data set far in excess of the data base used for the development of WGS-72. Included in these data sets are:

- a. Satellite radar altimetry observational data over large ocean areas (Geodynamic Experiment Ocean Satellite (GEOS-3), Sea Satellite (Seasat-1))
- b. Major surface gravity data bases
- c. Additional satellite tracking data, and
- d. Widespread scale control determinations.

2. The implementation of a new WGS will provide improved datum transformation constants and an improved model of the earth's gravity field. The gravity field associated with WGS-72 was based on surface gravity data and satellite tracking information available as of December 1972. Since 1972 additional data have been obtained which clearly indicate the deficiencies in the 1972 model. In addition to the direct effect on missile trajectories, the indirect effect on determining elevation above sea level from any earth centered system (e.g., Navy Navigation Satellite System (NNSS), Global Positioning System (GPS), or other positioning systems) is significant. Commercial users of the NNSS have abandoned use of the WGS-72 gravity field because of its inaccuracies. The NAVSTAR Global Positioning System will incorporate the new WGS. Other parameters of a world geodetic system which are of direct concern to DoD users are the size and shape of the ellipsoid and the transformation constants between local, preferred, and world datums. The size and shape change from WGS-72 is negligible; however, the set of points at which comparisons between local, preferred and world datums have been obtained has been greatly expanded. This should result in a better fit of the new WGS to a broad range of local datums.

3. DMA proposes to implement WGS-84 at the end of December 1984. Data defining the system are scheduled to be available by July 1984. The proposed implementation date was selected to be compatible with other major changes which are occurring; namely:

Decade of Progress — Decade of Challenge

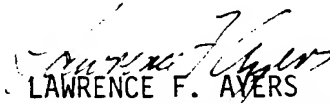


a. The recomputation of the North American Datum (NAD 83) which will be compatible with WGS-84, and which will be implemented in late 1984.

b. The abandonment by the U.S. Naval Observatory (USNO) of epoch B1950.0 in favor of J2000.0 beginning in January 1984.

The proposed coordinated implementation should reduce the number of times that changes are required.

4. The impact of this change will be negligible for users of small scale products or those products where relative accuracy is the primary consideration. The impact will be significant for those dealing with long range trajectories or elevations relative to mean sea level which have been determined using space based systems. DMA will evaluate the magnitude of the changes and promulgate the information to users shortly after the WGS-84 defining parameters have been determined.


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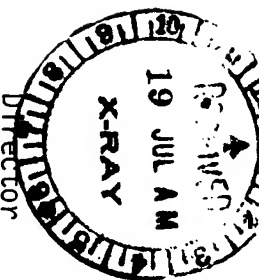
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